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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,082	12/10/2003	Ramesh Yarlagadda	23019-07460	7970

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EXAMINER

CHOI, WOO H

ART UNIT	PAPER NUMBER
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2189

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/734,082

Applicant(s)

YARLAGADDA ET AL.

Examiner

Woo H. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 – 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The independent claims 1 and 11 recite the limitation “the first and second data words” in lines 7 and 11, respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation “the load”. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation “the precharge situation”. There is insufficient antecedent basis for this limitation in the claim. It is also not clear what the term “precharge situation” means.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 – 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Hansen *et al.* (US Patent No. 6,006,318, hereinafter “Hansen”).

5. With respect to claims 1, 7, 8, 10, 11, and 12, Hansen discloses a method for accessing a plurality of dynamic random access memory (DRAM) devices in parallel, each DRAM device having at least one memory bank, the method comprising (figure 13, col. 19, lines 16 – 25, see also figure 14, lines 31 – 36):

determining a distribution of data segments of the first and second data words in a plurality of memory banks (the segments are distributed among the 8 DRAM banks, note that Hansen discloses interleaving as well), the plurality of memory banks being among the memory banks of the plurality of DRAM devices (all 8 segments of the two words are stored in parallel);

determining a sequence of retrieving the data segments based on the plurality of memory banks (the sequence of retrieving the data segments is determined by the banks are arranged and is the same as the sequence of distribution for storage, i.e., sequencing of the four data segments/word stored in banks 1-4 are preserved so that when they are retrieved, words are put back together in the original byte order in which they were stored).

retrieving the data segments in parallel from the plurality of memory banks based on the distribution and the sequence (see col. 19, lines 30 – 35, two banks of memory modules are coupled in parallel for parallel retrieval of data segments); and

reassembling the retrieved data segments into the first and second data words (see col. 19, lines 19 – 25, the sixteen bit segments must be reassembled to form a 64-bit word).

6. With respect to claim 2, receiving a retrieval request for the first data word and a retrieval request for the second data word, wherein the sequence can be different from the order of the retrieval requests received (order of a retrieval request has no effect in the sequence in which 16 bit segments of a word are stored in different bank of memory).
7. With respect to claims 3, 5 and 6, see figure 9. See also col. 4, lines 17 – 20.
8. With respect to claim 4, see figure 17.
9. With respect to claim 7, storing in parallel data segments of a data word into memory banks across a plurality of DRAM devices further comprises determining an in-bank burst length based upon the maximum word size (burst length is 1 for 64 bit words and 2 for 128 bit words), a total number of banks (4) in the plurality of DRAM devices and the data width of an individual bank (16 bits) and storing the data word in a burst having the in-bank burst length.
10. With respect to claim 8, each data segment is stored independently in different banks within a DRAM device.
11. With respect to claim 13, length of a burst is a multiple of the word size and the total number of banks and the data width within the bank are chosen based on the word size in Hansen. In Hansen, data segments are stored in parallel based on a multiple of a word size (2 words as shown in figure 14).

12. With respect to claim 14, data segments belonging to one word are retrieved in one burst.
13. With respect to claim 15, the sequence is determined by how a word was loaded into the memory location.
14. With respect to claim 17, see rejection of claim 1. Memory I/O scheduler is independent of any other schedulers in other systems.

Conclusion

15. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Woo H. Choi whose telephone number is (571) 272-4179. The examiner can normally be reached on M-F, 9:00-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Woo H. Choi
January 8, 2007